

Application Serial No.: 10/582,813
Attorney Docket No: 26068-27B

Examiner: D. Nguyen
Art Unit: 2818

REMARKS

Claims 12-16, 21-30, 32, 33, 35, 36, 39 and 40-48 are currently pending in this application. Claims 12, 21, 22 and 25 have been amended and claims 1-11, 17, 20, 31, 34, and 49-56 have been canceled. Claims 18-19 and 37-38 remain withdrawn from consideration as being directed to non-elected species.

Applicants continue to assert that the restriction between the claims in this application is improper and should be withdrawn for the reasons provided in the previous response. Applicants respectfully submit that the present invention fulfills the requirements for unity of invention pursuant to 37 CFR 1.475 because the claims are drawn to a product and the process of use of the product. However, in the interest of furthering prosecution, Applicants have cancelled the non-elected claims.

Claims 12, 16, 30 and 33 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 6,191,581 to Van Dau (hereinafter "Van Dau").

As to claims 12 and 16, Applicants have amended claim 12 to incorporate the features of claims 17 and 20 and thus it is respectfully submitted that amended claims 12 is not anticipated or rendered obvious by Van Dau and notice to that effect is earnestly solicited. Likewise, claim 16, which depends from claim 12 is also believed to be allowable over the prior art of record.

Applicants respectfully submit that none of the prior art cited, alone or in combination, describe or suggest the feature of a conductive film positioned directly above and directly below the active area of the magnetic sensor. The examiner has asserted that U.S. Patent No. 5,361,221 to Taguchi (hereinafter "Taguchi") describes the position of the conductive films as above and below the active area.

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However, Applicants respectfully submit that Taguchi does not describe or suggest the position of the films as in the present invention. As seen in Figure 18, Taguchi does not describe or suggest that the conductive film is positioned above and below the active area of the magnetic sensor but only teaches that the conductive film is positioned in the vicinity of the active area (i.e., adjacent to the active area).

Furthermore, Taguchi also does not describe or suggest planar Hall effect-based (PHE-based) sensors but instead only describes Extraordinary Hall effect-based (EHE-based) memory and is thus not combinable with Van Dau in the manner suggested by the Examiner. Van Dau and Taguchi teach different types of devices (magnetic sensors versus magnetic memory) in which the memory states are achieved in a very different manner (PHE-based devices versus EHE-based devices) as discussed in more detail below. Thus, Van Dau and Taguchi cannot be shown to be combinable in the manner suggested by the examiner to anticipate or render obvious the claimed invention.

For all of these reasons, Taguchi does not cure the deficiencies of Van Dau and neither Van Dau nor Taguchi, alone or in combination, describes or suggests all of the features of amended claim 12.

As to claims 30 and 33, Applicants have amended claim 30 to include the features of claims 31 and 34, that is to recite that the magnetic film is epitaxially grown on a perovskite single crystal so that easy axes of the thin film are perpendicular to each other and at a 45-degree angle relative to the direction of the current. These features are neither described nor suggested by Van Dau and claim 30 is believed to distinguish over Van Dau. Likewise, claim 33, which depends from claim 30 is also believed to be allowable over the prior art of record.

In addition, Applicants respectfully submit that Van Dau does not describe or suggest PHE-based magnetic memory but only discusses PHE-based magnetic sensors.

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Taguchi cannot be used to cure the deficiencies of Van Dau, because Taguchi describes EHE-based memory which is completely different from a PHE-based magnetic device.

In particular, the memory device described by Taguchi, which uses an electrical current flowing in the conductor to generate a transverse magnetic field EHE-based memory, is very different from the PHE-based sensor device described by Van Dau. In PHE-based memory systems, the two memory states are achieved by changing the orientation of the in-plane magnetization by 90 degrees (see e.g., claim 30 of the present invention), wherein in the two states, the magnetization is at 45 degrees relative to the current. In contrast, in the EHE-based memory system described by Taguchi, the two memory states are achieved by reversing the direction of perpendicular magnetization wherein in the two states the magnetization is perpendicular to the current (see Taguchi, e.g., col. 6, lines 54-64).

As a result of these differences, different materials and designs are used. In addition, dramatically different fields are generated in order to change the memory state. In fact, it is much easier to switch between the two states using the method of the present invention as compared with Taguchi and Taguchi cannot be shown to be combinable with Van Dau in the manner suggested by the Examiner.

For all of these reasons, amended claims 12, 16, 30 and 33 of the present invention can be shown to distinguish over Van Dau, alone or in combination with Taguchi, and notice to that effect is earnestly solicited.

Furthermore, claims 13-15, 24-29, 31, 32, 34 and 43-48 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Van Dau in view of U.S. Patent No. 5,721,654 to Manako (hereinafter "Manako").

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Because claim 12 is believed to be allowable over the prior art of record for the reasons provided above, claims 13-15 which depend therefrom are also believed to be allowable over the prior art of record and notice to that effect is earnestly solicited.

Claims 31 and 34 have been incorporated into claim 30 as discussed above. In addition, because claim 30 is believed to be allowable over the prior art of record for the reasons provided above, claims 32 and 43-48 which depend therefrom are also believed to be allowable over the prior art of record and notice to that effect is earnestly solicited.

Claims 17, 20-23, 35, 36 and 39-42 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Van Dau in view of U.S. Patent No. 5,361,226 to Taguchi.

As indicated above, claims 17 and 20 have been incorporated into claim 12 and claim 12 as amended is believed to distinguish over the combination of Van Dau in view of Taguchi. Therefore, claims 21-23 which depend therefrom are also believed to distinguish over the prior art of record and notice to that effect is earnestly solicited. Likewise, because claim 30 is believed to be allowable over the prior art of record for the reasons provided above, claims 35, 36 and 39-42 which depend therefrom are also believed to be allowable over the prior art of record and notice to that effect is earnestly solicited.

CONCLUSION

Applicants believe that the foregoing is a full and complete response to the Office Action of record. Accordingly, an early and favorable reconsideration of the rejection of the claims is requested. Applicants believe that claims 12-16, 21-30, 32, 33, 35, 36, 39 and 40-48 are now in condition for allowance and an indication of allowability and an early Notice of Allowance of all of the claims is respectfully requested.

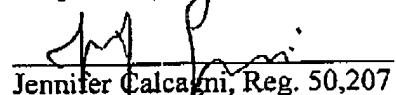
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If the Examiner feels that a telephonic interview would be helpful, he is requested to call the undersigned at (203) 575-2648 prior to issuance of the next Office action.

Respectfully submitted,


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